U.S. Department of Energy
Office of River Protection
Mr. Michael K. Barrett
Contracting Officer
P.O. Box 450, MSIN H6-60
Richland, Washington 99352

CCN: 036707

Dear Mr. Barrett:

CONTRACT NO. DE-AC27-01RV14136 – TRANSMITTAL FOR APPROVAL – AUTHORIZATION BASIS CHANGE NOTICE 24590-WTP-ABCN-ESH-02-018, REVISION 0, *FABRICATION AND INSTALLATION STANDARDS FOR EMBEDDED C5 DUCTWORK*

References: 1) CCN 036701, Letter,A. R. Veirup, BNI, to M. K. Barrett, ORP, "Request for Extension to Submit Authorization Basis Change Notice 24590-WTP-ABCN-ESH-02-018, Revision 0, As A Result of Decision to Deviate #24590-HLW-DTD-HV-02-001,"dated July 26, 2002.

2) CCN 035132, Letter,A. R. Veirup, BNI, to M. K. Barrett, ORP, "Decision to Deviate from the Authorization Basis for the Hanford Tank Waste Treatment and Immobilization Plant,"dated June 28, 2002.

Bechtel National, Inc. (BNI) is submitting Authorization Basis Change Notice (ABCN), 24590-WTP-ABCN-ESH-02-018, Revision 0, to the U.S. Department of Energy, Office of River Protection and the Office of Safety Regulation (OSR) for approval (attached). This ABCN requests approval to add a fabrication and installation standard for embedded C5 ductwork to allow the use of pipe material as ductwork. The ABCN proposes ASME B31.3, Process Piping will be added to SRD Safety Criteria 4.4-6, 4.4-7, 4.4-8, 5.3-4, and 5.3-5 and a corresponding reference to the applicable SRD section will be added to the PSAR for Partial Construction Authorization.

Approval of this ABCN is requested by, September 6, 2002, to meet the required implementation schedule for reconciliation of deviation to the authorization basis.

An electronic copy of ABCN 24590-WTP-ABCN-ESH-02-018, Revision 0, is provided for the OSR's information and use.

Please contact Mr. Bill Spezialetti at (509) 371-4654 for any questions or comments.

Very truly yours,

A. R. Veirup
Prime Contract Manager

TR/slr

Attachment: Authorization Basis Change Notice (ABCN), 24590-WTP-ABCN-ESH-02-018, Revision 0, plus attachments

cc: Name (ALPHABETIZE)	Organization	MSIN
Barr, R. C. w/a (1 hard copy and 1 electronic copy)	OSR	H6-60
Beranek, F. w/o	WTP	MS6-P1
Betts, J. P. w/o	WTP	MS4-A1
Cragin, D. J. w/a	WTP	MS7-ANW
DOE Correspondence Control w/a	ORP	H6-60
Erickson, L. w/a	ORP	H6-60
Gibson, K. D. w/a	WTP	MS6-R1
Naventi, R. F. w/o	WTP	MS4-A1
Nakao, R.M. w/a	WTP	MS4-B2
PDC w/a	WTP	MS5-K1
Ollero, J. E. w/o	ORP	H6-60
QA Project Files w/a	WTP	MS4-A2
Ryan, T. B. w/a	WTP	MS6-R1
Struthers, D. J. w/o	ORP	H6-60
Swailes, J. H. w/a	ORP	H6-60
Taylor, W. J. w/a	ORP	H6-60
Veirup, A. R. w/o	WTP	MS4-A1

Authorization Basis Change Notice

ABCN Number 24590-WTP-ABCN-ESH-02-018 Revision 0

ABCN Title Fabrication and installation standards for embedded C5 ductwork

I. ABCN Review and Approval Signatures

A. ABCN Preparation

Preparer: Daniel J. Cragin

Print/Type Name	*Signature*	*Date*

Reviewer: Ken Gibson

Print/Type Name	*Signature*	*Date*

B. Required Reviewers

Review Required?		*For each person checked Yes, that signature block must be completed.*		
☒	ES&H Manager	Fred Beranek *Print/Type Name*	*Signature*	*Date*
☒	QA Manager	George Shell *Print/Type Name*	*Signature*	*Date*
☒	PSC Chair	Bill Poulsen *Print/Type Name*	*Signature*	*Date*
☒	Operations Manager	Neil Brosee *Print/Type Name*	*Signature*	*Date*
☒	Engineering Manager	Fred Marsh *Print/Type Name*	*Signature*	*Date*
☐	Pretreatment APM	*Print/Type Name*	*Signature*	*Date*
☐	LAW APM	*Print/Type Name*	*Signature*	*Date*
☒	HLW APM	Phil Schuetz *Print/Type Name*	*Signature*	*Date*
☐	BOF APM	*Print/Type Name*	*Signature*	*Date*
☒	Construction Manager	Bill Clements *Print/Type Name*	*Signature*	*Date*
☐	Business/Project Controls Manager	*Print/Type Name*	*Signature*	*Date*
☐	ALARA PSC Subcommittee Chair	*Print/Type Name*	*Signature*	*Date*
☒	PMT Chair	Dennis Klein *Print/Type Name*	*Signature*	*Date*
		Print/Type Name	*Signature*	*Date*

Authorization Basis Change Notice

ABCN Number 24590-WTP-ABCN-ESH-02-018 Revision 0

ABCN Title Fabrication and installation standards for embedded C5 ductwork

C. ABCN Approval

WTP Project Manager Ron Naventi

Print/Type Name *Signature* *Date*

II. Description of the Proposed Change to the Authorization Basis

D. Affected AB Documents:

Title	Document Number	Revision
Safety Requirements Document Volume II	24590-WTP-SRD-ESH-01-001-02	1
Preliminary Safety Analysis Report to Support Partial Construction Authorization (HLW)	24590-WTP-PSAR-ESH-01-001-04	0

Decision to Deviate ☒ Yes ☐ No

If yes, DTD Number 24590-HLW-DTD-HV-02-001 Deficiency Report Number 24590-WTP-CAR-QA-02-129

Initiating Document Number Revision

E. Describe the proposed changes to the Authorization Basis Documents:

SRD requirements and PSAR references to C5 ductwork specify compliance with ASME AG-1, *Code on Nuclear Air and Gas Treatmen*t. This ABCN clarifies the fabrication and installation standard for embedded C5 ductwork to allow the use of pipe material as ductwork. Sections of ASME B31.3, *Process Piping* that are applicable to materials, fabrication, and visual inspection for Category D fluid service piping will be added to SRD Safety Criteria 4.4-6, 4.4-7, 4.4-8, 5.3-4 and 5.3-5. Specific sections being applied are detailed in Appendix C Section 15. A corresponding reference to the applicable SRD section will be added to the PSAR for Partial Construction Authorization. Implementation of this ABCN does not cause impact to project design or programs.

F. List associated ABCNs and AB documents, if any:

NA

G. Explain why the change is needed:

Due to duct wall thickness required for embedment in concrete the duct was fabricated as pipe in accordance with ASME B31.3 rather than ASME AG-1. AG-1 fabrication standards are limited to a duct wall thickness of 0.188". Wall thicknesses used for fabrication of ductwork to be embedded in concrete are 0.375". Since AG-1 governs the testing, operation and maintenance of process ventilation systems, both standards are necessary to allow fabrication, construction, and operation of all the components within the C5 system.

H. List the implementation activities and the projected completion dates:

Activity	Date
Inform DOE that AB has been revised and provide updated hard copy and electronic version of AB changes to DOE	30 days or less after DOE approval
Distribute controlled copy of revised pages	30 days after

Authorization Basis Change Notice

ABCN Number 24590-WTP-ABCN-ESH-02-018 Revision 0

ABCN Title Fabrication and installation standards for embedded C5 ductwork

H. List the implementation activities and the projected completion dates:

Activity	Date
	DOE approval

Revise the following implementing documents:

Documents	Describe extent of revisions	Date
1 Design media already reference ASME B31.3 for the C5 piping ductwork		
2		

Describe other activities:	Date
1 None required	
2	

III. Evaluation of the Proposed Change

I. Is DOE prior approval required?

1 Does the revision involve the deletion or modification of a standard previously identified or established in the SRD? **Yes** ☒ **No** ☐

Explain

Safety Requirements Document Volume II (24590-WTP-SRD-ESH-01-001-02) requirements reference ASME AG-1 as the standard for the C5 exhaust system. SRD Safety Criteria 4.4-6, 4.4-7, 4.4-8, 5.3-4 and 5.3-5 will be modified to add the fabrication and installation standard ASME B31.3 for the embedded components of the C5 exhaust system.

1 Does the revision result in the reduction in commitment currently described in the AB? **Yes** ☐ **No** ☒

Explain

The change is not a reduction in commitment because a standard is being added to the SRD to govern the fabrication and installation of pipe components as ductwork in the C5 exhaust system.

1 Does the revision result in a reduction in the effectiveness of any procedure, program, plan, or management process described in the AB? **Yes** ☐ **No** ☒

Explain

Adding a standard to the SRD is not a reduction in effectiveness of any procedure, program, plan, or management process described in the AB.

J. Complete the safety evaluation by describing how the revision to the AB:

Authorization Basis Change Notice

ABCN Number 24590-WTP-ABCN-ESH-02-018 Revision 0

ABCN Title Fabrication and installation standards for embedded C5 ductwork

1 will continue to comply with all applicable laws and regulations, conform to top-level safety standards, and provide adequate safety

Safety Criteria (SC) 4.4-6 through 4.4-8, 5.3-4 and 5.3-5 address the design of HVAC and offgas ventilation systems. Currently the identified Implementing Standards sets for these criteria are:

ASME AG-1-1997, *Code on Nuclear Air and Gas Treatment*
ASME N509-89, *Nuclear Power Plant Air Cleaning Units and Components*
ASME N510-1989 (Rev 1995), *Testing of Nuclear Air Cleaning Systems*
and
NFPA 801-95, *Standard for Facilities Handling Radioactive Materials* (SC 4.4-8 only).

Fabrication and installation of the portions of the C5 exhaust duct and offgas and pulse vent extract piping is being performed in accordance with ASME B31.3-96, *Process Piping*. Application of this standard will meet Safety Criteria 4.4-6 through 4.4-8, 5.3-4 and 5.3-5 because the standard will ensure operability under normal and accident conditions, permit appropriate periodic inspection and pressure and functional testing, and control radiological and chemical releases and generation of flammable and explosive gases during normal and off-normal conditions.

The adequacy of ASME B31.3 for use in these applications is documented in 24590-WTP-PSAR-ESH-01-001-04, *Preliminary Safety Analysis Report to Support Partial Construction Authorization*; HLW Facility Specific Information for the embedded C5 duct and
24590-WTP-PSAR-ESH-01-002-04, Preliminary *Safety Analysis Report to Support Construction Authorization; HLW Facility Specific Information* for all uses. Please refer to the following sections in the PSAR to Support Construction Authorization:

Section 4.3.5, C5 Area Ventilation Exhaust System, (4.3.5.4 Standards)
Section 4.3.10, Pulse Ventilation Treatment System (4.3.10.4 Standards)
Section 4.4.3, Offgas Treatment System (4.4.3.4 Standards)

In addition, the adequacy of ASME B31.3 for compliance with WAC 246-247 has been confirmed with the Washington State Department of Health (WDOH) as evidenced by their approval of the Phase I Radiological Notice of Construction.

1 will continue to conform to the original submittal requirements associated with the AB documents being revised

Safety Requirements Document Volume II will be revised to add an applicable standard. The change conforms to the original Safety Evaluation Report for the SRD.

1 will not result in inconsistencies with other commitments and descriptions contained in the AB or an authorization agreement

Safety Requirements Document Volume II and Preliminary Safety Analysis Report to Support Partial Construction Authorization will be modified to ensure consistency. The change does not result in inconsistencies with the Limited Construction Authorization Request or the Fundamental Aspects of Design in Volume 2 of the Initial Safety Analysis Report.

K. Justification of the Proposed Change

Authorization Basis Change Notice

ABCN Number 24590-WTP-ABCN-ESH-02-018 Revision 0

ABCN Title Fabrication and installation standards for embedded C5 ductwork

Provide a justification that demonstrates that the proposed change is safe

The fabrication and installation of embedded C5 duct and embedded Pulse Jet Vent piping does not affect the imminent release of radiological or chemical materials. The use of ASME B31.3 is adequate to ensure public and worker protection as identified in the safety evaluations performed in the PSARs. In addition, the embedded portions of the exhaust path are surrounded by concrete such that any postulated leakage would be contained within the system. DOE has approved of the use of ASME B31.3 as a standard for C5 exhaust ductwork in Section 4.3.2.4 of the PSAR to Support Partial Construction (HLW Facility Specific).

L. Certification of Continued SRD Adequacy

Based on evaluations from III.I.1 and III.J.1. If question III.I.1 is marked "yes, Project Manager certification is required. The Project Manager's signature certifies that the revised SRD continues to identify a set of standards that provide adequate safety, complies with WTP applicable laws and regulations, and conforms with top-level safety standards and principles. This certification is based on adherence to the DOE/RL-96-0004 standards identification process and successful completion of review and confirmation by the PSC.

WTP Project Manager: Ron Naventi

Print/Type Name	*Signature*	*Date*

M. List of Attachments

1. Proposed SRD page changes
2. Proposed PSAR page changes

24590-WTP-ABCN-ESH-02-018 Rev 0

Attachment 1

Proposed SRD Page Changes

Document Part	Title	No. of Pages
Section 4.4	Electrical and Mechanical Systems	8
Section 5.0	Radiation Protection	9
Appendix C	X.0 ASME B31.3–1996, Process Piping	2

# of pages (including cover sheet): 20

4.4 Electrical and Mechanical Systems

Safety Criterion: 4.4 - 1

A list of electric and mechanical components designated as Important to Safety shall be prepared and maintained. The list shall include:

(1) The performance specifications for normal operation and under conditions existing during and following accidents.

(2) The load, pressure, voltage, frequency, and other characteristics, as appropriate, for which the performance specified can be ensured.

Implementing Codes and Standards

24590-WTP-SRD-ESH-01-001-02, *Safety Requirements Document Volume II*
Appendix A, "Implementing Standard for Safety Standards and Requirements Identification"

Safety Criterion: 4.4 - 2

Structures, systems, and components Important to Safety shall be designed and qualified to function as intended in the environments associated with the events for which they are intended to respond. The effects of aging on normal and abnormal functioning shall be considered in design and qualification.

Implementing Codes and Standards

10 CFR 50.49, "Environmental qualification of electric equipment important to safety for nuclear power"
IEEE 323-83, *Qualifying Class 1E Equipment for Nuclear Power Generating Stations*

Regulatory Basis

DOE/RL-96-0006 *4.2.2.3 Proven Engineering Practices/Margins-Safety System Design and Qualification*

Safety Criterion: 4.4 - 3

This Criterion has been deleted.

Safety Criterion: 4.4 - 4

Structures, systems, and components Important to Safety shall be designated, designed and constructed to permit appropriate inspection, testing, and maintenance throughout their operating lives to verify their continued acceptability for service with an adequate safety margin.

Systems and components designated as Important to Safety that are located in closed cells where access is not possible during facility operation or scheduled shutdown periods shall be designed and constructed to standards aimed at ensuring their suitability for the entire service life with an adequate safety margin. Alternately, provisions may be made for remote replacement, standby cells, or equipment or other methods capable of ensuring a serviceable facility with adequate safety for the duration of the intended operating life.

Implementing Codes and Standards

24590-WTP-SRD-ESH-01-001-02, *Safety Requirements Document Volume II*
Appendix A, "Implementing Standard for Safety Standards and Requirements Identification"
Appendix E, "Reliability, Availability, Maintainability, and Inspectability (RAMI)"
IEEE 338-1987, *Standard Criteria for the Periodic Surveillance Testing of Nuclear Power Generating Station Safety Systems*
ISA S84.01-1996, *Application of Safety Instrumented Systems for the Process Industries*

Regulatory Basis

DOE/RL-96-0006 4.2.7.1 Reliability, Availability, Maintainability, and Inspectability (RAMI)-Reliability
DOE/RL-96-0006 4.2.7.2 Reliability, Availability, Maintainability, and Inspectability (RAMI)-Availability, Maintainability, and Inspectability

Safety Criterion: 4.4 - 5

Each air treatment system designated as Safety Design Class shall have suitable redundancy in components and features, and suitable interconnections, leak detection, isolation, and confinement capabilities to ensure that for onsite electric power system operation (assuming offsite power is not available) and for offsite electric power system operation (assuming onsite power is not available) its safety function can be accomplished, assuming a single failure.

The use of alternate equipment may be considered to satisfy the single failure requirement.

Implementing Codes and Standards

IEEE 379-1994, *Application of the Single Failure Criterion to Nuclear Power Generating Station Safety Systems*
ISA S84.01-1996, *Application of Safety Instrumented Systems for the Process Industries*

Safety Criterion: 4.4 - 6

Each air treatment system designated as Safety Design Class shall be designed to ensure its operability under normal and accident conditions. The design shall permit appropriate periodic inspection and pressure and functional testing to assure:

(1) the structural and leaktight integrity of its components

(2) the operability and performance of the active components of the systems such as fans, filters, dampers, pumps, and valves

(3) the operability of the systems as a whole and, under conditions as close to design as practical, the performance of the full operational sequence that brings the systems into operation, including operation of applicable portions of the protection system, the transfer between normal and emergency power sources, and the operation of associated systems

Implementing Codes and Standards

ASME N509-89, *Nuclear Power Plant Air Cleaning Units and Components*
ASME AG-1-1997, *Code on Nuclear Air and Gas Treatment*
ASME N510-1989, *Testing of Nuclear Air Treatment Systems*
IEEE 338-1987, *Standard Criteria for the Periodic Surveillance Testing of Nuclear Power Generating Station Safety Systems*
ASME B31.3-1996, *Process Piping*

Safety Criterion: 4.4 - 7

Each air treatment system designated as Safety Design Significant shall be designed to ensure its operability under normal conditions. The design shall permit appropriate periodic inspection and pressure and functional testing to assure:

(1) the structural and leaktight integrity of its components

(2) the operability and performance of the active components of the systems such as fans, filters, dampers, pumps, and valves

(3) the operability of the systems as a whole and, under conditions as close to design as practical, the performance of the full operational sequence that brings the systems into operation, including operation of applicable portions of the protection system

Implementing Codes and Standards

ASME AG-1-1997, *Code on Nuclear Air and Gas Treatment*
ASME N509-89, *Nuclear Power Plant Air Cleaning Units and Components*
ASME N510-1989, *Testing of Nuclear Air Treatment Systems*
ASME B31.3-1996, *Process Piping*

Safety Criterion: 4.4 - 8

Ventilation systems and off-gas systems must be provided where necessary to control radiological and chemical material releases and the generation of flammable and explosive gases during normal and off-normal conditions.

Implementing Codes and Standards

ASME AG-1-1997, *Code on Nuclear Air and Gas Treatment*
ASME N509-89, *Nuclear Power Plant Air Cleaning Units and Components*
ASME N510-1989 (Rev 1995), *Testing of Nuclear Air Cleaning Systems*
NFPA 801-95, *Standard for Facilities Handling Radioactive Materials*

Regulatory Basis

10 CFR 835 Occupational Radiation Protection Location: 1002
ASME B31.3-1996, *Process Piping*

Safety Criterion: 4.4 - 9

An onsite electric power system and an offsite electric power system shall be provided to permit functioning of systems designated as Safety Design Class. The safety function for each system (assuming the other system is not functioning) shall be to provide sufficient capacity and capability to assure Safety Design Class functions are maintained in the event of postulated accidents. The onsite electric power supplies, including the batteries, and the onsite electric distribution system, shall have sufficient independence, redundancy, and testability to perform their specified safety functions assuming a single failure.

Implementing Codes and Standards

IEEE 308-91, *Criteria for Class 1E Power Systems for Nuclear Power Generating Stations*
IEEE 384-1992, *Standard Criteria for Independence of Class 1E Equipment and Circuits*
IEEE 450-1995, *Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations*

IEEE 484-1996, *Recommended Practice for Installation Design and Installation of Large Lead Storage Batteries for Generating Stations and Substations*
IEEE 485-1983, *Recommended Practice for Sizing Large Lead Storage Batteries for Generating Stations and Substations*
IEEE 628-1987, *Standard Criteria for the Design, Installation, and Qualification of Raceway Systems for Class 1E Circuits for Nuclear Power Generating Stations*
IEEE 741-1990, *Criteria for the Protection of Class 1E Power Systems and Equipment in Nuclear Power Generating Stations*
IEEE 946-1992, *Design of Safety-Related DC Auxiliary Power Systems for Nuclear Power Generating Stations*

Safety Criterion: 4.4 - 10

Physical and electrical separation shall be provided between diverse or redundant Safety Design Class electrical systems. Associated circuits should be avoided.

Implementing Codes and Standards

IEEE 384-1992, *Standard Criteria for Independence of Class 1E Equipment and Circuits*
IEEE 628-1987, *Standard Criteria for the Design, Installation, and Qualification of Raceway Systems for Class 1E Circuits for Nuclear Power Generating Stations*

Safety Criterion: 4.4 - 11

Electric power systems designated as Safety Design Class shall be designed to ensure their operability under normal and accident conditions. The design shall permit appropriate periodic inspection and testing of important areas and features, such as wiring, insulation, connections, and switchboards, to assess the continuity of the systems and the condition of their components. The systems shall be designed with a capability to periodically test:

(1) the operability and functional performance of the components of the systems, such as onsite power sources, relays, switches, and buses

(2) the operability of the systems as a whole and, under conditions as close to design as practical, the full operation sequence that brings the systems into operation, including operation of applicable portions of the protection system, and the transfer of the offsite power system and the onsite power system

Implementing Codes and Standards

IEEE 338-1987, *Criteria for the Periodic Surveillance Testing of Nuclear Power Generating Station Safety Systems*
IEEE 344-1987, *Recommended Practice for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations*
IEEE 384-1992, *Standard Criteria for Independence of Class 1E Equipment and Circuits*
IEEE 387-1995, *Standard Criteria for Diesel-Generator Units Applied as Standby Power Generating Stations*

Safety Criterion: 4.4 - 12

Electric power systems designated as Safety Design Significant shall be designed to ensure their operability under normal conditions. The design shall permit appropriate periodic inspection and testing of important areas and features, such as wiring, insulation, connections, and switchboards, to assess the continuity of the systems and the condition of their components. The systems shall be designed with a capability to periodically test:

(1) the operability and functional performance of the components of the systems, such as onsite power sources, relays, switches, and buses

(2) the operability of the systems as a whole and, under conditions as close to design as practical, the full operation sequence that brings the systems into operation, including operation of applicable portions of the protection system

Implementing Codes and Standards

IEEE 338-1987, *Standard Criteria for the Periodic Surveillance Testing of Nuclear Power Generating Station Safety Systems*
IEEE 384-1992, *Standard Criteria for Independence of Class 1E Equipment and Circuits*
NFPA 70-1999, *National Electric Code*

Safety Criterion: 4.4 - 13

Instrument air systems designated as Safety Design Class shall have suitable redundancy in components and features, and suitable interconnections, leak detection, and isolation capabilities shall be provided to ensure that for onsite electric power system operation (assuming offsite power is not available) and for offsite electric power system operation (assuming on-site power is not available) the system safety function can be accomplished, assuming a single failure.

Implementing Codes and Standards

ANS 59.3-1992, *Nuclear Safety Criteria for Control Air Systems*
IEEE 379-1994, *Application of the Single Failure Criterion to Nuclear Power Generating Station Safety Systems*
ISA S84.01-1996, *Application of Safety Instrumented Systems for the Process Industries*

Safety Criterion: 4.4 - 14

Instrument air systems designated as Safety Design Class that provide air to a non-Safety Design Class air system shall be provided with adequate isolation such that failure of the non-Safety Design Class portion of the system will not prevent the Safety Design Class portion from performing its specified safety function.

Implementing Codes and Standards

ANS 59.3-1992, *Nuclear Safety Criteria for Control Air Systems*

Safety Criterion: 4.4 - 15

Instrument air systems designated as Safety Design Class shall be designed to ensure their operability under normal and accident conditions. The design shall permit appropriate periodic pressure and functional testing to assure:

(1) air quality

(2) the structural integrity of its components

(3) the operability and the performance of the active components of the system

(4) the operability of the system as a whole and, under conditions as close to design as practical, including operation of applicable portions of the protection system and the transfer between normal and emergency power sources

Implementing Codes and Standards

ANS 59.3-1992, *Nuclear Safety Criteria for Control Air Systems*
ASME B31.3-96, *Process Piping*
ASME PTC 9-70, *Performance Test Codes, Displacement Compressors, Vacuum Pumps and Blowers*
ASME SEC VIII, *Boiler and Pressure Vessel Codes, Rules for Construction of Pressure Vessels*
IEEE 338-1987, *Standard Criteria for the Periodic Surveillance Testing of Nuclear Power Generating Station Safety Systems*

Safety Criterion: 4.4 - 16

Instrument air systems designated as Safety Design Significant shall be designed to ensure their operability under normal conditions. The design shall permit appropriate periodic pressure and functional testing to assure:

(1) air quality

(2) the structural integrity of its components

(3) the operability and the performance of the active components of the system

(4) the operability of the system as a whole and, under conditions as close to design as practical, including operation of applicable portions of the protection system

Implementing Codes and Standards

ASME B31.3-96, *Process Piping*
ASME PTC 9-70, *Performance Test Codes, Displacement Compressors, Vacuum Pumps and Blowers*
ASME SEC VIII, *Boiler and Pressure Vessel Codes, Rules for Construction of Pressure Vessels*
ISA S7.0.01-1996, *Quality Standard for Instrument Air*

Safety Criterion: 4.4 - 17

Instrument air systems supplying air to Important to Safety equipment shall provide clean, dry, and oil free air to this equipment. The instrument air shall be free of all corrosive and hazardous gases which may be drawn into the system.

Implementing Codes and Standards

ISA S7.0.01-1996, *Quality Standard for Instrument Air*

Safety Criterion: 4.4 - 18

Cooling water systems designated as Safety Design Class shall have suitable redundancy in components and features, and suitable interconnections, leak detection, and isolation capabilities shall be provided to ensure that for onsite electric power system operation (assuming offsite power is not available) and for offsite electric power system operation (assuming on-site power is not available) the system safety function can be accomplished, assuming a single failure.

Implementing Codes and Standards

IEEE 379-1994, *Application of the Single Failure Criterion to Nuclear Power Generating Station Safety Systems*
ISA S84.01-1996, *Application of Safety Instrumented Systems for the Process Industries*

Safety Criterion: 4.4 - 19

Cooling water systems designated as Safety Design Class shall be designed to ensure their operability under normal and accident conditions. The design shall permit appropriate periodic inspection and pressure and functional testing to assure:

(1) Long term corrosion and/or organic fouling that could degrade system performance is detected. This shall include consideration of the impacts of organic fouling on heat exchanger performance.

(2) The potential for radioactive leakage into and out of the system and to the environment is minimized.

(3) The structural and leaktight integrity of its components.

(4) The operability and the performance of the active components of the system.

(5) The operability of the system as a whole and, under conditions as close to design as practical, including operation of applicable portions of the protection system and the transfer between normal and emergency power sources.

Implementing Codes and Standards

ASME B31.3-96, *Process Piping*
ASME SEC VIII, *Boiler and Pressure Vessel Codes, Rules for Construction of Pressure Vessels*
IEEE 338-1987, *Standard Criteria for the Periodic Surveillance Testing of Nuclear Power Generating Station Safety Systems*

Safety Criterion: 4.4 - 20

Cooling water systems designated as Safety Design Significant shall be designed to ensure their operability under normal conditions. The design shall permit appropriate periodic inspection and pressure and functional testing to assure:

(1) Long term corrosion and/or organic fouling that could degrade system performance is detected. This shall include consideration of the impacts of organic fouling on heat exchanger performance.

(2) The potential for radioactive leakage into and out of the system and to the environment is minimized.

(3) The structural and leaktight integrity of its components.

(4) The operability and the performance of the active components of the system.

(5) The operability of the system as a whole and, under conditions as close to design as practical, including operation of applicable portions of the protection system.

Implementing Codes and Standards

ASME B31.3-96, *Process Piping*
ASME SEC VIII, *Boiler and Pressure Vessel Codes, Rules for Construction of Pressure Vessels*
NFPA 214-96, *Standard on Water-Cooling Towers*
TEMA B, C, or R TEMA Class "B", "C", or "R" Heat Exchangers Mechanical Standards

Safety Criterion: 4.4 - 21

Safety Design Class motor operated valves shall be specified to ensure operability against the maximum differential pressure that might occur while performing their specified accident prevention or mitigation safety function at the minimum specified terminal voltage. Consideration for mis-positioned valves is not a requirement in determining the maximum differential pressure.

Periodic testing of Safety Design Class motor operated valves shall be performed to confirm their ability to perform their specified accident prevention or mitigation safety function.

Implementing Codes and Standards

IEEE 338-1987, *Standard Criteria for the Periodic Surveillance Testing of Nuclear Power Generating Station Safety Systems*

5.0 Radiation Protection

Safety Criterion: 5.0 - 1

A Radiation Protection Program (RPP) compliant with 10 CFR 835 shall be developed and submitted for approval to DOE.

The WTP Radiological Controls Program shall address all items in 10 CFR 835 and the additional Safety Criteria provided in SRD Volume II Sections 5.1 and 5.2.

Implementing Codes and Standards

DOE G 441.1-1, *Management and Administration of Radiation Protection Programs Guide*

Regulatory Basis

10 CFR 835 Occupational Radiation Protection Location: 101(a-f)
DOE/RL-96-0006 4.2.3.1 Radiation Protection-Radiation Protection Practices
DOE/RL-96-0006 4.3.2.1 Radiation Protection-Radiation Practices
DOE/RL-96-0006 4.3.2.2 Radiation Protection-Procedures and Monitoring

5.1 Occupational Radiation Protection

Safety Criterion: 5.1 - 1

This safety criterion has been deleted.

Safety Criterion: 5.1 - 2

A respiratory protection program shall be established that includes:

(1) Use of respiratory protection equipment, including equipment used as emergency devices, that is tested and certified or had certification extended by the National Institute for Occupational Safety and Health/Mine Safety and Health Administration (NIOSH/MSHA).

(2) Air sampling sufficient to identify the potential hazard, permit proper equipment selection, and estimate exposures.

(3) Surveys and bioassays, as appropriate, to evaluate actual intakes.

(4) Testing of respirators for operability immediately prior to each use.

(5) Written procedures regarding selection, fitting, issuance, maintenance, and testing of respirators, including testing for operability immediately prior to each use; supervision and training of personnel; monitoring, including air sampling and bioassays; and recordkeeping.

(6) Determination by a physician prior to the initial fitting of respirators, and either every 12 months thereafter or periodically at a frequency determined by a physician, that the individual user is medically fit to use the respiratory protection equipment.

(7) A written policy statement on respirator usage covering:

(i) The use of process or other engineering controls, instead of respirators.

(ii) The routine, nonroutine, and emergency use of respirators.

(iii) The periods of respirator use and relief from respirator use. Each respirator user will be informed that they may leave the area at any time for relief from respirator use in the event of equipment malfunction, physical or psychological distress, procedural or communication failure, significant deterioration of operating conditions, or any other conditions that might require such relief.

(8) Use of equipment within limitations for type and mode of use and provision for proper visual, communication, and other special capabilities (such as adequate skin protection) when needed.

(9) Notification to the Regulator, in writing, at least 30 days before the date that respiratory protection equipment is first used to protect workers from airborne radioactivity.

Implementing Codes and Standards

ANSI Z-88.2-1992, *American National Standard for Respiratory Protection*

Safety Criterion: 5.1 - 3

This safety criterion has been deleted.

Safety Criterion: 5.1 - 4

This safety criterion has been deleted.

Safety Criterion: 5.1 - 5

This safety criterion has been deleted.

Safety Criterion: 5.1 - 6

This safety criterion has been deleted.

Safety Criterion: 5.1 - 7

This safety criterion has been deleted.

5.2 Occupational Radiation Protection Design

Safety Criterion: 5.2 - 1

This Safety Criterion has been deleted

Safety Criterion: 5.2 - 2

This Safety Criterion has been deleted

Safety Criterion: 5.2 - 3

This Safety Criterion has been deleted

Safety Criterion: 5.2 - 4

This Safety Criterion has been deleted

5.3 Environmental Radiation Protection

Safety Criterion: 5.3 - 1

An Environmental Radiological Protection Program shall be prepared and submitted to the regulator.

The Environmental Radiological Protection Program (ERPP) shall address the following elements, as appropriate:

(1) the identity of existing and anticipated types of activities and areas of the site subject to the ERPP

(2) the measures to be used to implement the ERPP

(3) the methods to be used to monitor, report, and record compliance with the ERPP

(4) models and methods used for dose assessment including bioaccumulation and dose-conversion factors

(5) an As Low As is Reasonably Achievable (ALARA) Program

(6) effluent and environmental monitoring including:

- (i) sources of airborne emissions
- (ii) sources of discharges in liquid waste streams
- (iii) effluent monitoring
- (iv) environmental surveillance
- (v) meteorological data acquisition
- (vi) pre-operational evaluation

(7) ground water protection

(8) radiological protection in the management of radioactive waste

(9) controls on the release of materials

(10) property containing residual radioactive materials

Implementing Codes and Standards

ANSI/ISO-14001-1996, *Environmental Management Systems - Specifications with guidance for use*

Regulatory Basis

DE-AC06-96RL13308 Part I Section C.5 Table S4-1
DOE/RL-96-0006 4.3.2.1 Radiation Protection-Radiation Practices
DOE/RL-96-0006 4.3.2.2 Radiation Protection-Procedures and Monitoring

Safety Criterion: 5.3 - 2

The ALARA Program shall ensure that releases of radioactive materials to the environment and exposures to the public during normal operations shall be kept ALARA and within prescribed limits.

Implementing Codes and Standards

DOE G 441.1-2, *Occupational ALARA Program Guide*

Regulatory Basis

DOE/RL-96-0006 3.2 Radiation Protection Objective
DOE/RL-96-0006 4.2.3.2 Radiation Protection-Radiation Protection Features
WAC 173-480 Ambient Air Quality Standards and Emission Limits for Radionuclides Location: Part 050 (1)

Safety Criterion: 5.3 - 3

A waste management program shall ensure compliance with all applicable laws and regulations. The waste management program shall also ensure that the radiological impact to the general public and environment due to radioactive wastes arising from WTP operation shall be ALARA.

Implementing Codes and Standards

IAEA Safety Series No. 50-SG-011, *Operational Management for Radioactive Effluents and Wastes Arising in Nuclear Power Plants*
ANSI/ISO-14001-1996, *Environmental Management Systems - Specifications with guidance for use*

Regulatory Basis

DOE/RL-96-0006 3.2 Radiation Protection Objective
DOE/RL-96-0006 4.2.3.2 Radiation Protection-Radiation Protection Features

Safety Criterion: 5.3 - 4

Equipment shall be designed and installed to monitor and maintain control over radioactive materials in gaseous and liquid effluents produced during normal operations, including anticipated operational occurrences.

Implementing Codes and Standards

40 CFR 52, Appendix E, "Performance Specifications and Specification Test Procedures for Monitoring Systems for Effluent Stream Gas Volumetric Flow Rate"
40 CFR 60, Appendix A, Methods 1, 1a, 2, 2a, 2c, 2d, 4, 5,and 17
ANSI N13.1-1969 (R 1993), *Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities*
ANSI N42.18-1980 (R 1991), *Specification and Performance of On-Site Instrumentation for Continuously Monitoring Radioactivity in Effluents*
ANSI N323, *Radiation Protection Instrumentation Test and Calibration*
ASME/ANSI AG-1, *Code on Nuclear Air and Gas Treatment*
ASME/ANSI N509, *Nuclear Power Plant Air-Cleaning Units and Components*
ASME/ANSI N510, *Testing of Nuclear Air Cleaning Systems*
ASME B31.3-1996, *Process Piping*

Regulatory Basis

DOE/RL-96-0006 3.2 Radiation Protection Objective
DOE/RL-96-0006 4.2.3.2 Radiation Protection-Radiation Protection Features
WAC 246-247 Radiation Protection - Air Emissions Location: Part 075
WAC 246-247 Radiation Protection - Air Emissions Location: Part 110
WAC 246-247 Radiation Protection - Air Emissions Location: Part 120

Safety Criterion: 5.3 - 5

All new construction and significant modifications of air emission units shall utilize best available radionuclide control technology (BARCT).

Implementing Codes and Standards

WAC 246-247-120, Appendix B, "BARCT Compliance Demonstration"
ASME/ANSI AG-1, *Code on Nuclear Air and Gas Treatment*
ASME/ANSI N509, *Nuclear Power Plant Air-Cleaning Units and Components*
ASME/ANSI N510, *Testing of Nuclear Air Cleaning Systems*
ANSI N13.1, *Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities*
ANSI N42.18, *Specification and Performance of On-Site Instrumentation for Continuously Monitoring Radioactivity in Effluents*
40 CFR 60, Appendix A, Methods 1, 1a, 2, 2a, 2c, 2d, 4, 5,and 17
ASME B31.3-1996, *Process Piping*

Regulatory Basis

WAC 173-480 Ambient Air Quality Standards and Emission Limits for Radionuclides Location: Part 060
WAC 246-247 Radiation Protection - Air Emissions Location: Part 040 (3)

Safety Criterion: 5.3 - 6

Activities shall be conducted in such a manner that no radioactive material is discharged into sanitary sewers. Exempt from this Safety Criterion are trace radioactive materials present in:

(1) readily soluble waste such as kitchen waste from breakrooms, custodial cleaning solutions, or other materials of similar non-WTP process origin

(2) biological waste (solid and liquid human waste) which is readily dispersed in water

Also exempt from this Safety Criterion are excreta from individuals undergoing medical diagnosis or therapy with radioactive materials.

Implementing Codes and Standards

IAEA Safety Series No. 50-SG-011, *Operational Management for Radioactive Effluents and Wastes Arising in Nuclear Power Plants*

Regulatory Basis

DOE/RL-96-0006 3.2 Radiation Protection Objective
DOE/RL-96-0006 4.2.3.2 Radiation Protection-Radiation Protection Features

Safety Criterion: 5.3 - 7

Liquid discharges from the facility, other than sanitary sewer discharges, shall comply with ALARA process requirements, be treated by the best available technology, and not result in release of settleable solids to surface waters for streams exceeding 5 pCi/g for alpha-emitting radionuclides, and/or 50 pCi/g for beta-emitting radionuclides.

Note: The WTP design does not include provisions for liquid waste discharges, other than sanitary sewer discharges. Therefore, Implementing Codes and Standards are not required. If the WTP design changes such that liquid discharges result, an SRD revision will be prepared.

Safety Criterion: 5.3 - 8

Controls on the release of materials and property containing residual radioactive material shall be established.

Implementing Codes and Standards

10 CFR 835, "Occupational Radiation Protection", Appendix D (ad hoc)

Note: The Appendix D values will be used as surface contamination criteria for determining the suitability of releasing material from radiologically controlled areas. These criteria are not applicable to materials potentially contaminated throughout their volume. Because the WTP process feed is a mixed waste, any items that are determined to be contaminated, will also be assumed to be a mixed waste (i.e., containing a State of Washington dangerous waste). Rather than determine the quantities of dangerous wastes present, these materials will be disposed of as mixed wastes.

Regulatory Basis

DOE/RL-96-0006	*3.2*	*Radiation Protection Objective*
DOE/RL-96-0006	*4.2.3.1*	*Radiation Protection-Radiation Protection Practices*

5.4 Environmental Radiological Monitoring

Safety Criterion: 5.4 - 1

Each source shall have capability for independent effluent emission testing as follows:

(1) Sampling ports adequate for test methods applicable to each source

(2) Safe sampling platform(s)

(3) Safe access to sampling platform(s)

(4) Utilities for sampling and testing equipment

(5) Any other facilities deemed necessary to safely and properly test a source

Implementing Codes and Standards

ANSI N13.1-1969 (R 1993), *Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities*

Regulatory Basis

40 CFR 61	*National Emission Standards for Hazardous Air Pollutants*	*Location: 13*
WAC 246-247	*Radiation Protection - Air Emissions*	*Location: Part 075 (10)*
WAC 246-247	*Radiation Protection - Air Emissions*	*Location: Part 075 (9)*

Safety Criterion: 5.4 - 2

Nonpoint and fugitive emissions of radioactive material shall be monitored.

Implementing Codes and Standards

ANSI N13.1-1969 (R 1993), *Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities*

Regulatory Basis

WAC 246-247	*Radiation Protection - Air Emissions*	*Location: Part 075 (8)*

Safety Criterion: 5.4 - 3

Direct measurements shall be made, to the extent practicable, to obtain information characterizing source terms, exposures, exposure modes, and other information needed in evaluating doses.

Implementing Codes and Standards
ANSI N13.1-1969 (R 1993), *Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities*

Regulatory Basis
WAC 246-221 Radiation Protection Standards Location: 070 (1)

Safety Criterion: 5.4 - 4

When the effluents from a single source, or from two or more sources subject to the same emission standards, are combined before being released to the atmosphere, a monitoring system shall be installed on each effluent or on the combined effluent. If two or more sources are not subject to the same emission standards, a separate monitoring system shall be installed on each effluent. If the applicable standard is a mass emission standard and the effluent from one source is released to the atmosphere through more than one point, a monitoring system shall be installed at each emission point.

Implementing Codes and Standards
ANSI N13.1-1969 (R 1993), *Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities*

Regulatory Basis
40 CFR 61 National Emission Standards for Hazardous Air Pollutants Location: 14 (d)

Safety Criterion: 5.4 - 5

Equipment and procedures used for the continuous monitoring of radioactive air emissions shall conform, to applicable guidance.

Implementing Codes and Standards
40 CFR 52, Appendix E, "Performance Specifications and Specification Test Procedures for Monitoring Systems for Effluent Stream Gas Volumetric Flow Rate"
40 CFR 60, Appendix A, Test Methods 1, 1a, 2, 2a, 2c, 2d, 4, 5,and 17
40 CFR 61, Appendix B, Test Method 114
ANSI N13.1-1969 (R 1993), *Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities*
ANSI N323, *Radiation Protection Instrumentation Test and Calibration*
ANSI N42.18-1980 (R 1991), *Specification and Performance of On-Site Instrumentation for Continuously Monitoring Radioactivity in Effluents*

Regulatory Basis
40 CFR 61 National Emission Standards for Hazardous Air Pollutants Location: 93
WAC 246-247 Radiation Protection - Air Emissions Location: Part 075 (2)

Safety Criterion: 5.4 - 6

Computer codes or procedures used to determine the offsite total effective dose equivalent from airborne emissions shall be EPA approved.

Implementing Codes and Standards
ANSI/ISO-14001-1996, *Environmental Management Systems - Specification with Guidance for Use*

Regulatory Basis
40 CFR 61 National Emission Standards for Hazardous Air Pollutants Location: 93

WAC 246-247 Radiation Protection - Air Emissions Location: Part 085 (2)

Safety Criterion: 5.4 - 7

Compliance with the annual dose limit for individual members of the public (100 mrem/yr from all sources) shall be shown by:

(1) Demonstrating by measurement or calculation that the total effective dose equivalent to the individual likely to receive the highest dose from the operation does not exceed the annual dose limit; or

(2) Demonstrating that:

(a) The annual average concentrations of radioactive material released in gaseous and liquid effluents at the boundary of the unrestricted area do not exceed the values specified in Table II of WAC246-221-290.

(b) If an individual were continuously present in an unrestricted area, the dose from external sources would not exceed 0.002 rem in an hour and 0.05 rem in a year.

Implementing Codes and Standards

ANSI/ISO-14001-1996, *Environmental Management Systems - Specification with Guidance for Use*

Regulatory Basis

40 CFR 61 National Emission Standards for Hazardous Air Pollutants Location: 93
WAC 246-221 Radiation Protection Standards Location: 070 (2)
WAC 246-247 Radiation Protection - Air Emissions Location: Part 085 (1)

Safety Criterion: 5.4 - 8

Compliance with the public air emission standard shall be determined by calculating the highest effective dose equivalent to any member of the public at any offsite point where there is a residence, school, business or office.

The determination of compliance shall include all radioactive air emissions resulting from routine and nonroutine operations for the past calendar year.

Implementing Codes and Standards

ANSI/ISO-14001-1996, *Environmental Management Systems - Specification with Guidance for Use*

Regulatory Basis

40 CFR 61 National Emission Standards for Hazardous Air Pollutants Location: 94
WAC 246-247 Radiation Protection - Air Emissions Location: Part 085 (3)

Safety Criterion: 5.4 - 9

Records sufficient to demonstrate compliance with the dose limit for individual members of the public shall be maintained. Records must document the source of input parameters including the results of all measurements upon which they are based, the calculations and/or analytical methods used to derive values for input parameters, and the procedure used to determine compliance. This documentation should be sufficient to allow an independent auditor to verify the accuracy of the determination made concerning the facility's compliance.

Implementing Codes and Standards

ANSI/ISO-14001-1996, *Environmental Management Systems - Specification with Guidance for Use*

Regulatory Basis

40 CFR 61 National Emission Standards for Hazardous Air Pollutants Location: 95
WAC 246-247 Radiation Protection - Air Emissions Location: Part 080

Safety Criterion: 5.4 - 10

An environmental surveillance program shall be developed and implemented to include:

(1) Meteorological data acquisition (Note 1)

(2) Pre-operational evaluation (Note 2)

(3) Near-Facility Monitoring (Note 3)

(4) Ground Water Protection (Note 4)

Implementing Codes and Standards

ANSI/ISO-14001-1996, *Environmental Management Systems - Specification with guidance for use*
IAEA Safety Series No 41, *Objectives and Design of Environmental Monitoring Programmes for Radioactive Contaminants*

Notes:

1. BNFL-5193-ID-03, *Interface Control Document*, Revision 2, *ICD-22 between DOE and BNFL Inc. for Air Emissions,* Table 2 states that DOE will maintain the Hanford Site Air Operating Permit (AOP) and provide access to meteorological data.
2. BNFL-5193-ID-03, *Interface Control Document*, Revision 2, *ICD-09 Between DOE and BNFL Inc. for Land Siting,* Table 1, describes specific interfaces responsibilities for the WTP contractor and for the DOE. Item 12 of the table requires that the WTP contractor perform any additional site characterization work beyond that which was performed by the DOE. The RPP describes the plans and measures for compliance with the survey and contamination control requirements of 10 CFR 835.
3. As described in BNFL-5193-ID-03, *Interface Control Document*, Revision 2, *ICD-22 between DOE and BNFL Inc. for Air Emissions,* DOE will continue to operate site and near-facility monitoring networks in the vicinity of the WTP site. Additional monitoring which is required will be provided by the WTP contractor. If additional monitoring is required, it will be performed consistent with the Hanford Site near-facility monitoring program for inclusion in site annual reports (example, HNF-EP-0573-6, *Hanford site Near-Facility Environmental Monitoring Annual Report, Calendar Year 1997*).
4. BNFL-5193-ID-03, *Interface Control Document*, Revision 2, *ICD-09 between DOE and BNFL Inc. for Land Siting,* Section 3.3, Ground Water Monitoring Wells, states that that the DOE will "…close groundwater monitoring well E25-32 prior to the start of site work…" There is no liquid discharge to the environment from WTP operations. Transfer piping to the Effluent Treatment Facility is by means of a three-inch pipe encased in a 6-inch pipe. Potential leakage from the transfer pipe is contained, and collected by the outer pipe. Accidental release of the inner pipe contents would be detected by the transfer pipe leak detection equipment. If both inner and outer pipes failed, such leakage could result in soil contamination which would be remediated prior to any contamination reaching the ground water.

Regulatory Basis

DOE/RL-96-0006 3.2 Radiation Protection Objective
DOE/RL-96-0006 4.2.3.1 Radiation Protection-Radiation Protection Practices

24590-WTP-ABCN-ESH-02-018 Rev 0

Attachment 2

Proposed PSAR Page Changes

Document Part	Title	No. of Pages
4	Important to Safety Structures, Systems, and Components	1

# of pages (including cover sheet): 2

4.3.2.3 Functional Requirements

The C5 exhaust system will be capable of 1) confining aerosols, and 3) maintaining cascade air flow. The ductwork is required to provide for unrestricted airflow from process areas to the HEPA filters. The ductwork is required to withstand a caustic environment up to 13.95 pH.

With respect to the DBE analysis, the C5 ventilation ductwork will be designed to meet SRD criteria 4.1-2, 4.1-3, 4.1-5, 4.2-1, ~~and~~ 4.2-2, and 4.4-6.

4.3.2.4 Identification and Evaluation of Codes and Standards

The proposed design of the C5 exhaust system within the HLW vitrification process is adequate to meet the required safety function, that is, 1) direct exhaust air through the HEPA filters and 2) in conjunction with the in-bleed system maintain cascade airflow from areas of lower contamination to areas of higher contamination.

C5 Ductwork:

1 The specified materials will ensure secondary confinement of airborne releases by the ductwork from all cells, caves, and tunnels up to the exhaust fans.
   - Welding procedures and welder qualifications will be to the requirements of the ASME Boiler and Pressure Vessel Code, section IX.
   - The C5 ductwork will be welded stainless steel pipe in accordance with ASME B31.3.

3 The construction and materials specified will ensure the ductwork will withstand potential moisture challenges and caustic aerosols due to process upsets**.** The ductwork of the C5 exhaust is welded stainless steel.

4.3.2.5 System Evaluation

The proposed design of the HLW C5 ventilation system ductwork is adequate to meet the required safety function to1) ensure confinement of radioactive materials during normal, abnormal, and accident conditions and 2) enable placing and maintaining the facility in a safe state. Changes to the design of the C5 exhaust system will be controlled to approved procedures and evaluated via the ISM process.

4.3.2.6 Controls TSRs

The C5 exhaust system ductwork including the HEPA filter housings from the melter cell up to the exhaust fans are required to provide confinement of aerosols and to withstand potential moisture and caustic challenges. This requirement is considered a design features, which will be discussed in section 5.6 (of the draft TSRs that will be provided in the construction authorization request).

4.4 References

WTP Project Documents

24590-WTP-SRD-ESH-01-001-02, *Safety Requirements Document, Volume II*